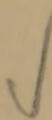


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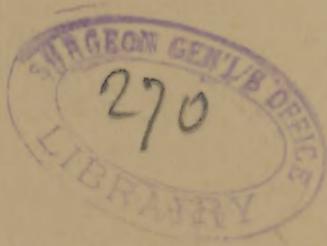
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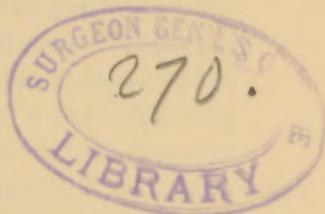
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WASHINGTON.

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THE METRE-LENS:

ITS ENGLISH NAME AND EQUIVALENT.

By SWAN M. BURNETT, M. D.,
WASHINGTON.

IN the number of this Journal for July 24th there is an article by Dr. E. G. Loring on "Dioptric, Dioptre, Dioptrie, or Dioptry?" in which two points in physiological optics, concerning which there seem as yet to be differences of opinion, are discussed; and, as some utterances of mine are made the basis of his observations, I beg leave to say something in reply, not only in defense of my own position, but, as I believe, in assistance to a proper settlement of the questions at issue.

The first point is in reference to the English name of the metre-lens, or *dioptrie*, as it is called in French. In my review of Dr. Loring's most admirable text-book of "Ophthalmoscopy," in the last number of the "Archives of Ophthalmology," I took him to task for sanctioning the use of the word "dioptric" as applied to the metre-lens. Dr. Loring's "retort courteous" is that I was myself one of the first to use the word. I am sorry to say that is true. I remember it among my sins of commission in the past; and if I am responsible, in any degree, as I am afraid I am, for the introduction of that word into English nomenclature, I am now making the only reparation possible, in trying to get it out.

I happened to be in Paris at the time of the adoption of the metric system into ophthalmology, and Dr. Landolt asked me to translate his paper on the subject for some English journal. This I readily agreed to do, and the translation appeared in the "Royal London Ophthalmic Hospital Reports," vol. viii, part iii, appearing as an appendix, the editor kindly holding the number back for several days in order that it might be inserted, and this was, I believe, the first important contribution on that subject that was printed in the English language.

As to the English equivalent of the word "dioptrie," both Dr. Landolt and I were long in doubt, but finally decided upon "dioptric," principally, I think, because I had heard it used by Dr. Snellen (who, I believe, is a good English scholar) during my visit to Utrecht, and from whom I first learned of the adoption of the metric system by the Congress at Heidelberg.

I was, however, never satisfied with the word, and, when I undertook the translation of Dr. Landolt's "Examination of the Eyes," I consulted with several scholars and ophthalmologists in this country, with the result that the word *dioptry*—pl. *dioptries*—was used in that work and has been by me ever since. Our purpose was simply to anglicize the French word by changing *ie* into *y*, as is so often done. Thus we have (*F.*) *ophthalmoscopie*, (*E.*) *ophthalmoscopy*, and so on for almost every term used in ophthalmology whose termination is in *ie*. This we thought at least to be safe, for it was sustained by uniformity and precedent, which could not be said of any of the other terms suggested.

As to *dioptre*, it is neither "fish, flesh, fowl, nor good red herring." It is not French, for the French is *dioptrie*; it certainly is not German or Italian, and no proper English word (at least according to our American standards) ends in *re*.

As to substantives ending in the usual adjective terminal *ic*, there is no warrant for them in good usage ; and as to the one which Dr. Loring has singled out in support of his position—the singular noun “optic”—the illustration is singularly unfortunate, for, while Pope may say :

“ The difference is as great between

 The *optics* seeing and the objects seen,”

most of us will only remember that classical street phrase—

“ The bully boy with a crystal optic.”

Moreover, in this connection it must be remembered that my use of the word *dioptric* was eleven years ago, and, in a progressive science like ophthalmology, a present consistency with past opinions or expressions should not be insisted on. That man is exceedingly fortunate who does not find some of the misconceptions and mistakes of his professional youth awkwardly confronting him in his more mature years.

And now as to the second point. Dr. Loring can not understand why I consider “it unaccountable that he should accept 1 D as equal to thirty-six inches focus,” and maintains that he stated expressly in the text of his book that, “as the French metre is equal to *thirty-seven* inches, $1 D = \frac{1}{37}$.” My objection to *his* statement is, that it is neither clear nor correct. If he meant *French* inches, it is not clear, for it is not presumable that the author of a book written in the English language for English people, who have a standard inch of their own, should accept the inch of another nation as a standard without so stating it expressly and whenever the word inch is used.* We have accepted the metre as a

* Dr. Loring thinks I am mistaken when I say that “most of the lenses used in this country are ground to the English inch,” and says Mr. Hunter and Mr. Meyrowitz use glasses ground to the French inch. Nevertheless, I have been informed by several of our extensive manufacturing opticians that the English inch is the one used by them.

standard of measure ; but I can not see that we are for that reason compelled to accept the French inch. If he meant English inches, he is, of course, incorrect, as he will himself acknowledge.

In connection with this subject he quotes several paragraphs from my translation of Landolt's book in apparent support of his proposition. It may be stated in reference to that book that I was not the editor, but simply the translator, and did not and do not hold myself responsible for any of the opinions expressed therein. But I think a reference to the work will show that whenever the word inch is used there can be no mistake as to whether it is French or English ; at least we aimed at that amount of clearness.

What Dr. Loring says in regard to a variation of the focus with the varying index of refraction is perfectly true, and his formulæ are in every particular correct ; but, strange as it may appear, they "have nothing to do with the case."

The metric system was devised and adopted for the express purpose of getting rid of the difficulties, perplexities, and complications which he now brings forward again for discussion.

The standard metre-lens is one having a focus of one metre, and this is entirely independent of its radius of curvature and index of refraction. The acceptance of a certain refractive power as expressed by the focal distance of the lens, thus making it the same and uniform among all peoples, was the chief claim of the system to existence, and the only difficulty that could be encountered in the adoption of the system by any nation was in ascertaining how many of its inches constituted a metre. We have no longer to consider radius of curvature and index of refraction. Those are things that must be attended to by the optician. If we order a lens 1 D it must have a focal distance of one metre whether its radius of curvature be 20 or 40 inches, or its

index of refraction 1.2 or 1.9. The sole question, therefore, we have to determine in this country is the equivalent of this lens in the measure that is accepted as a standard among us. This measure, I think, no one will deny to be the English inch, 39.5 of which make one metre. The fact that we may employ a lens that is ground to the French inch radius of curvature is of minor importance; in fact, of no consequence whatever, since its value is only reckoned by its focal distance; if that is one metre, it is 1 D; if one half a metre, it is 2 D; if two metres, it is 0.5 D. These values, however, can be expressed, in reciprocals, in any other measure we may choose—feet, inches, lines, cubits, or what not, but the absolute value of the metre-lens remains forever fixed, wherever ground and whatever the index of refraction of the glass of which it is made, and all the confusion that has arisen in regard to the conversion of the one system into the other has been due to the fact that, at the beginning, we attempted to make it easy for the opticians to use the old stock of lenses they had on hand, and which were numbered according to their radius of curvature in inches. That reason should have passed away long ago, and, if the metre-lens is to give us the simplicity and uniformity we have the right to demand of it, it is to be obtained only by ignoring radius of curvature and refractive index, and holding in mind only the focal distance.

This does not, however, prevent us from giving, as mentioned above, the reciprocals of these foci in inches; indeed, it is often of great advantage to do so, and Dr. Loring has done it to much profit in his text-book in the matter of clearness in his treatment of the questions of the determination of the refraction by means of the ophthalmoscope; and, until the metric system of notation becomes thoroughly established among us, it will often be necessary to express metre-lens values in inch reciprocals.

But what inch shall we use? Shall we import one which is even less familiar to us than the metre, or shall we use the one with which we have always been accustomed to work and whose exact value is known of all men? The metre-lens has a focus of 39.5 English inches. If a lens has a longer or a shorter focus, it is not 1 D. No great error, however, can come from considering 1 D = 40 English inches, and its division into parts is scarcely more difficult than with 36 as a standard.

Moreover, the metric system is used to denote the refracting power of the eye as expressed in its near- and far-points. These distances are usually reckoned in metric or inch measure. Would Dr. Loring have this done in French inches, and would he so teach his pupils, not one in ten of whom knows a French inch when he sees it?

We could not forbear to express our regret that Dr. Loring, whose appendix on optics to his text-book is a marvel of simplicity and clearness, should have added to the confusion which already exists on this point. If he had accepted forty inches as the reciprocal of one metre, I believe the question would have been settled finally in this country; and, in spite of all he has said, it still remains to me "unaccountable" that he, in the face of incontrovertible facts, should not have done so.

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